



FAA-E-2287
March 31, 1967
SUPERSIDING
FAA-R-1329, 10/24/60

FEDERAL AVIATION AGENCY SPECIFICATION

CONTROL SYSTEM, RECEIVER AUDIO

1. SCOPE AND CLASSIFICATION

1.1 Scope. - The equipment described herein is an audio control system consisting of two separate panels Type I and Type II. The system is intended for installation at Airway Communication Stations, Airport Control Towers, Air Route Traffic Control Centers, etc.

1.2 Classification

Type I - Receiver mixing and channel selector panel.

Type II - Receiver volume control panel.

2. APPLICABLE DOCUMENTS

2.1 FAA specifications. - The following FAA specifications, of the issues specified in the invitation for bid or request for proposals, form a part of this specification:

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|--------------|---|
| FAA-D-1272 | Instruction Booklets, Electronic Equipment |
| FAA-G-2100/I | Electronic Equipment, General Requirements; |
| | Part I, General Requirements for all Equipments |
| FAA-R-1030 | Packing of Electronic Equipment |

(Copies of this specification and other applicable FAA specifications and drawings may be obtained from the Federal Aviation Agency, Washington, D. C., 20553, Attention: Contracting Officer. Requests should fully identify material desired, i.e., specification numbers, dated, amendment numbers, complete drawing numbers; also request should state the contract involved or other use to be made of the requested material.)

3. REQUIREMENTS

3.1 Equipment to be furnished by the contractor. - Each Type I and Type II equipment furnished by the contractor shall be complete and ready for operation, meeting all the requirements of this specification. Instruction booklets shall be in accordance with FAA-D-1272. Both the Type I and Type II equipment shall be covered in one booklet. Quantities of each type of equipment, and of instruction booklets, shall be as specified in the contract schedule.

3.1.1 General. - The Type I Receiver Mixing and Channel Selector is usually mounted in an approximately vertical plane, such that moving the handle of a lever key switch to the left connects the output of that receiving channel to the operator's headphones through the "PHONES" volume control on the Receiver Volume Control Panel. The receiver output will continue to be heard in the headphones until the operator moves the key to the center or off position. The "SPEAKER" position of the lever key switches is normally to the right. Operation of a switch connects the receiver channel to the speaker through the volume control marked "SPEAKER" on the Receiver Volume Control Panel. The Type II Receiver Volume Control Panel permits control by each operator of his speaker and headphone volume. At locations where more than one operating position is installed, wherein each position requires the same receiving channel, independent operation of the respective positions is possible through dual channel amplifiers. Dual channel amplifiers are not a part of this requirement. The neon indicator lights provided for each channel in the Receiver Mixing and Channel Selector are energized by the incoming audio signal. The operation of these lights upon an incoming signal is independent of the positions of the lever key switches.

3.1.2 Channel Isolation. - When a Type I equipment and a Type II equipment are interconnected, isolation between all channels shall be not less than 50 db.

3.1.3 Interchangeable connectors. - The brand name connectors specified in 3.9 and 3.20 hereto are subject to the requirements of 1-3.4.1.2 of FAA-G-2100/1. It is further required that if electrical connectors other than those listed herein are substituted by the contractor, the substituted connectors shall mate with the connectors listed herein, so that the equipment manufactured under this specification can be interchanged with existing equipment at FAA facilities without wiring or connector changes.

3.2 Type I equipment. - Type I equipment shall be as specified in paragraphs 3.3 to 3.74 below.

3.3 Construction. - The Receiver Mixing and Channel Selector shall be constructed on a 3/16 inch aluminum panel, 1-31/32 +1/64 inches wide by 4-31/32 +1/64 inches high, with four mounting holes, spaced 1-1/2 inches between centers along top and bottom edges and 4-1/2 inches between centers along each side. The center of each hole shall be 15/64 inch from the adjacent edges. Holes shall be drilled with a #8 drill. Indicator lamps, switches, card holders and identification strip shall be mounted in positions similar to those shown in Drawing DR-B-40068-24A. Resistors shall be mounted on solder terminals. Cambridge Thermionic Corporation Type Cambricon X1558 or equal. Solder terminals shall be installed on a phenolic component mounting board not less than 3/32 inch thick. Four 10-32 by 1/2 inch truss head screws shall be furnished with each panel.

3.3.1 Front panel finish. - The finish of the front panel shall be in accordance with FAA-G-2100/1, 1-3.8.2.

3.3.2 Chassis. - The chassis shall be constructed of nominal 0.063 inch aluminum stock in such a manner that upon insertion or removal of the connector plug there shall be no apparent flexing of the chassis.

3.4 Nameplate. - The nameplate (title RECEIVER MIXING AND CHANNEL SELECTOR) shall be in accordance with FAA-G-2100/1, 1-3.13, reduced in size, and mounted in a position similar to that shown in Drawing DR-40068-24A.

3.5 Card holders. - Four metal card holders approximately 7/8 inch long by 1/4 inch wide with clear transparent plastic windows and white cards shall be mounted on the front panel in positions similar to those shown in Drawing DR-B-40068-24A. The finish shall be the same as the front panel. Facilities shall be incorporated to allow easy removal and replacement of the card and window without removing the holder.

3.6 Identification plate. - An identification plate shall be mounted on the front panel. In material, method of marking and general appearance it shall be the same as the standard nameplate but shall carry only the type number and serial number of the equipment. In mounting it shall be in a position similar to that shown on Drawing DR-B-40068-24A. Dimensions of the identification plate shall be approximately 1-1/4 inches long by 1/4 inch wide. The design shall be submitted with that of the nameplate for approval.

3.7 Indicator lamps. - Indicator lamps shall be mounted on the front panel in positions similar to those shown on Drawing DR-B-40068-24A. The lamp shall be a NE2D, or equal. Lamp holder shall be Hetherington, Inc., Series L15,000B with a clear white lens, or equal.

3.8 Switches.- Switches shall be mounted on the front panel in positions similar to those shown on Drawing DR-B-40068-24A. Switches shall be mounted in such a position so that the switches are thrown on a horizontal plane from right to left. Switches shall be Switchcraft model 13036 DL or equal. Knobs shall be of molded plastic; four (4) black knobs installed, and one (1) red and one (1) white knob included as operational accessories.

3.9 Connector socket and plug.- The connector socket and plug shall be Amphenol 26 Series, Blue Ribbon, 16 contact with Latch-Type keyed shell, or equal. Chassis J501 receptacle shall be Amphenol No. 26-4401-16P, and plug P501 shall be Amphenol No. 26-4301-16S. See 3.1.3.

3.10 Resistors R501 through R508.- Resistors R501 through R508 shall be 1/2 watt fixed-composition, 220K ohms \pm 10%.

3.11 Resistors R509 through R512.- Resistors R509 through R512 shall be 1/2 watt fixed-composition, 470K ohms \pm 10%.

3.12 Marking on front panel.- The switches shall be marked with appropriate "P" and "S" as shown on Drawing DR-B-40068-24A.

3.13 Marking of Parts.- Parts shall be marked in accordance with Drawing DR-B-40068-5A and FAA-G-2100/1.

3.14 Wiring.- The Receiver Mixing and Channel Selector shall be wired in accordance with Drawing DR-B-40068-5A and FAA-G-2100/1.

3.15 Type II equipment.- The Type II equipment shall be as specified in paragraphs 3.15.1 to 3.24 below.

3.15.1 General.- The Receiver Volume Control Panel is an assembly of two potentiometers, and a connector and plug which control the volume in the operator's speaker or headphone of the receiver audio signal selected by the Type I receiver mixing and channel selector 3.2.

3.16 Construction.- The Receiver Volume Control Panel shall be constructed on a 5 $\frac{7}{16}$ inch aluminum panel, 1-3/132 \pm 1/64 inches wide by 4-3/132 \pm 1/64" high, with four mounting holes, spaced 1-1/2 inches between centers along the top and bottom edges and 4-1/2 inches between centers along each side. The center of each hole shall be 15/64 inch from the adjacent edges. Holes shall be drilled with a #8 drill. Potentiometers, designation plates, and identification strip shall be mounted in positions similar to those shown in Drawing DR-B-40068-25A. Four 10-32 by 1/2 inch truss head screws shall be furnished with each panel.

3.16.1 Front panel finish.- The finish of the front panel shall be in accordance with FAA-G-2100/1, 1-3.8.2.

3.16.2 Chassis.- The chassis shall be constructed of nominal 0.063 inch aluminum stock in such a manner that upon insertion or removal of the connector plug there shall be no apparent flexing of the chassis.

3.17 Nameplate.- The nameplate (title RECEIVER VOLUME CONTROL PANEL) shall be in accordance with FAA-G-2100/1, 1-3.13, reduced in size, and mounted in accordance with Drawing DR-B-40068-25A.

3.18 "SPEAKER" and "PHONES" designation plates.- A designation plate approximately 1-3/4 inches square, shall be mounted on the front panel for each of the volume controls. In material, method of marking and general appearance they shall be the same as the standard nameplate. The designation plates for the "SPEAKER" and "PHONE" volume controls shall be calibrated from 1 through 10 as shown on Drawing DR-B-40068-25A. Spacing of the mounting holes shall be such that the plates can be mounted as shown on Drawing DR-B-40068-25A or rotated 90° in each direction.

3.19 Identification plate.- An identification plate shall be mounted on the front panel. In material, method of marking and general appearance it shall be the same as the standard nameplate but shall carry only the type number and serial number of the equipment. In mounting, it shall be in a position similar to that shown on Drawing DR-B-40068-25A. Dimensions of the identification plate shall be approximately 1-1/4 inches long by 1/4 inch wide. The design shall be submitted with that of the nameplate for approval.

3.20 Connector plug and socket.- The connector plug and socket shall be Amphenol 26 Series, Blue Ribbon, 16 contact with Latch-Type keyed shell. The J601 receptacle shall be Amphenol No. 26-4402-16P and plug P601 shall be Amphenol No. 26-4302-16S. See 3.1.3.

3.21 Resistors R601 and R602.- Resistors R601 and R602 shall be composition potentiometers, 5,000 ohms 10%, 2W, clockwise log "A" taper, round shaft. Resistors shall be wired so that clockwise rotation of the knobs result in an increase of the output signals.

3.22 Marking of parts.- All parts shall be marked in accordance with Drawing DR-A-40068-6A and FAA-G-2100/1.

3.23 Wiring.- The Receiver Volume Control Panel shall be wired in accordance with Drawing DR-A-40068-6A and FAA-G-2100/1.

3.24 Control knobs.- Control knobs shall be in accordance with FAA-G-2100/1, and Drawing DR-C-21415, knob diameter 1 inch.

4. QUALITY ASSURANCE PROVISIONS**4.1 Design qualification test.- See FAA-G-2100/1.****4.2 Type tests.- None.**

4.3 Production tests (system basis).- The following system test shall be made using one Receiver Mixing and Channel Selector and one Receiver Volume Control Panel. Pairs of units interconnected for the system tests may be varied to suit production schedules, provided each unit on the contract shall be tested.

Channel Isolation**Paragraph 3.1.2, 4.5**

4.4 Application of Input voltage.- Input voltage shall be applied through a non-inductive series resistor equal in value (within 1%) to the nominal input impedance. The input level at the input terminals of the equipment shall be taken as E_1 , calculated from the formula below after measuring E . In no case shall a measured value of E_1 be used in calculations as the input to the equipment.

$$E = \text{Signal source voltage applied through series resistor } R \\ \text{equal to the nominal impedance of the circuit.}$$

$$E_1 = \text{Voltage input to equipment.}$$

$$E_1 = E \frac{R}{Z}$$

4.5 Channel Isolation.- Interconnect one Receiver Mixing and Channel Selector and one Receiver Volume Control Panel and test as follows:

Step 1.

Place "SPEAKER" and "PHONE" volume controls in the maximum clockwise positions. (Volume controls shall remain in these positions throughout the test.)

Step 2.

Apply a 3,000 Hz, 200 volt signal to the input of one channel, with its associated switch in the "SPEAKER" position, all other switches in the center (off) position. Place VTM across the "SPEAKER" output of the Receiver Volume Control Panel. Record reading.

Step 3.

Remove the signal from the above channel input and replace with a 20K ohm 1% noninductive resistor.

Step 4.

4.3 Production tests (system basis).- Apply the 3,000 Hz, 200 volt signal to the input of each of the remaining channels and record the output readings.

Step 5.

Repeat Steps 2, 3, and 4, with appropriate switch in the "PHONES" position and the VTM across the "PHONE" output of the Receiver Volume Control Panel. Record all readings.

Step 6.

Repeat Steps 2, 3, 4, and 5 for each of the remaining channels. Record all readings.

5. PREPARATION FOR DELIVERY

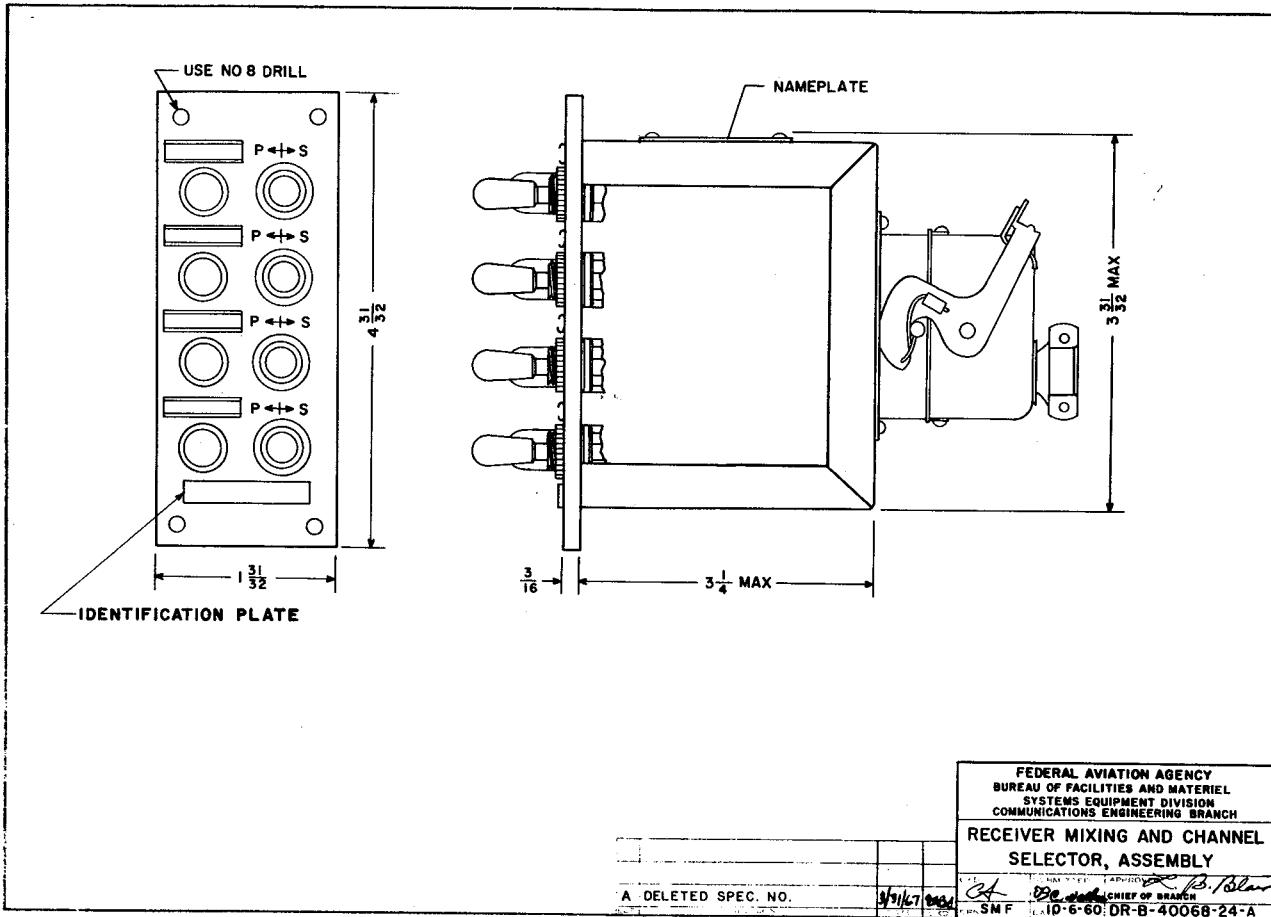
5.1 General.- See FAA-R-1030. Each unit shall be individually packed for domestic shipment unless otherwise specified in the contract.

6. NOTES**6.1 None.**

Attach following Page 7: Drawings DR-B-40068-24A, DR-B-40068-5A, DR-A-40068-2A, DR-A-40068-6A.

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Attach following Page 7: Drawings DR-B-40068-24A, DR-B-40068-5A, DR-R-40068-2A,



FEDERAL AVIATION AGENCY
BUREAU OF FACILITIES AND MATERIEL
SYSTEMS EQUIPMENT DIVISION
COMMUNICATIONS ENGINEERING BRANCH

RECEIVER MIXING AND CHANNEL
SELECTOR, ASSEMBLY

A DELETED SPEC. NO. 3/31/67 0000

C. B. Blaw CHIEF OF BRANCH

SMF ID-6-60 DR-B-40068-24-A

